REMARKS/ARGUMENTS

The claims are 11-12, 15, 16, and 18. Claims 11, 16, and 18 have been amended to improve their form or to better define the invention. Claims 13, 14, and 17 have been canceled in view of the amendments to claims 16 and 18. Support may be found, *inter alia*, in the disclosure at page 5, second full paragraph, the paragraph bridging pages 15 and 16, the first full paragraph of page 16, and FIG. 1. Reconsideration is expressly requested.

The Examiner suggested amending claim 16 to delete the "and/or" conjunction, the phrase referring to the bridge inverter being designed for adapting the pulse duration, and the word "respectively". The Examiner requested that claims 16 and 18 be amended to use the term "capacitances" instead of "capacities". The Examiner also requested that "respectively" be deleted from claim 18 and that the term "permanently" of claim 18 be changed to "continuously". Claims 16 and 18 have been amended to incorporate these suggestions made by the Examiner and to make other changes to better define the invention.

The Examiner objected to claim 11 as having improper antecedent basis for the term "the period duration". Claim 11

has been amended to recite "a period duration or a frequency" which it is respectfully submitted overcomes the Examiner's objection.

Claims 11-18 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Nakata et al. U.S. Patent No. 5,625,539* in view of *Melanson U.S. Patent No. 6,294,954*.

In the Examiner's view, *Nakata et al.* discloses a solar inverter with the claimed features that can perform the steps of the claimed method, except for implementing the dead time of the inverter, *Melanson* teaches sensing the current and adapting the dead time based on the sensed current, and it would have been obvious to add the dead-time design and dead-time adaptation steps of *Melanson* to the inverter and method of *Nkata et al.* for the reason of setting the dead time to the optimal level, as taught by *Melanson*.

In response, Applicants have amended claims 16 and 18 to better define the invention and respectfully traverse the Examiner's rejection for the following reasons.

As set forth in claims 16 and 18 as amended, Applicants' invention provides a solar inverter and method for a solar inverter for feeding current produced by a d.c. voltage source formed by a solar module into an a.c. voltage grid. The solar inverter includes a transformer, and the current produced by the d.c. voltage source is detected from current flowing over the primary winding of the transformer. A dead time of the switching elements of the bridge inverter is set or adapted as a function of the mean value of the detected current flowing over the primary winding of the transformer by selecting the dead time from a table with correspondingly stored data for the most varying mean values. The dead time represents a time of the switching elements for switching over from one switching element to a further switching element connected in series of the bridge inverter, thereby ensuring that parasitic capacitances stored in the switching elements of the bridge inverter can be completely recharged and no excessively long switching pauses can occur at the same time.

In this manner, Applicants' invention provides a method and a solar inverter for feeding current produced by a d.c. voltage source formed by a solar module into an a.c. voltage grid which simply and substantially increase the effectiveness of a solar

inverter.

Melanson describes an adaptive dead time control for switching circuits showing a similar result like Applicants' invention as recited in claim 16 as amended and claim 18 as amended but describes a totally different way to achieve this result. *Melanson* describes a circuit which detects the switching behavior of the switching element or transistors and a control circuit for varying the dead time between the switching elements in order to hold the dead time as small as possible without overlapping of the on signals occurring.

Applicants' invention as recited in claim 16 as amended and claim 18 as amended uses predefined values for the dead time for different mean values of the current flowing over the primary winding of the transformer as an indicator of the energy of the DC voltage source. As shown in FIG. 1 of the specification, in Applicants' method as recited in claim 18 amended and in Applicants' solar inverter as recited in claim 16 as amended, the current I_{Tr} through the primary winding 19 of the transformer 18 is detected by a current measurement unit 26. After a presetable period of time has passed, the control device 24 detects the values delivered by the current measurement unit 26 and forms a mean value therefrom. Depending from the mean value of the primary current I_{Tr}, a predefined dead time 42 is determined. See

the paragraph bridging pages 15 and 16 and the first full paragraph of page 16 of the specification.

The state of the art according to *Melanson* needs an overlap detection circuit for measuring the amount of the dead time or overlap between the two switches which is not necessary according to Applicants' invention as recited in claim 16 as amended and claim 18 as amended.

None of the cited references discloses or suggests a method for feeding current produced by a d.c. voltage source formed by a solar module into an a.c. voltage grid a solar inverter, wherein a dead time of the switching elements of the bridge inverter is set as a function of the mean value of the current that is detected flowing over the primary winding of the transformer by selecting the dead time from a table with correspondingly stored data for the most varying mean values as recited in Applicants' claim 16 as amended and claim 18 as amended.

As the Examiner has recognized, the primary reference to *Nakata et al.* fails to disclose or suggest controlling or regulating the dead time of the bridge inverter.

Melanson fails to disclose or suggest setting a dead time of the switching elements of the bridge inverter as a function of

the mean value of the detected current of the d.c. voltage source flowing over the primary winding of the transformer by selecting the dead time from a table with correspondingly stored data for the most varying mean values. *Melanson* instead discloses optimizing a dead time by measuring the dead time and the current and placing these measurements on a graph, and then finding a "knee" on this current vs. dead time curve. The dead time value at this "knee" represents an optimal dead time. See *Melanson* at column 1, lines 55-67. This method of selecting a dead time is completely different than the method for selecting a dead time as recited in claim 18 as amended, and the solar inverter of Applicants' claim 16 as amended is designed differently than the solar inverter of *Nakata et al.* alone or as modified by the teachings of *Melanson*.

Accordingly, it is respectfully submitted that claims 16 and 18 as amended, together with claims 11, 12 and 15 which depend on claim 18 as amended, are patentable over the cited references.

Claim 11 as amended is dependent on claim 18 and further specifies that a period duration or a frequency for the pulse width modulation for switching over the switching elements of the bridge inverter is set as a function of the current detected. In addition to being patentable because of the arguments provided

above, Applicants' invention as recited in claim 11 as amended is patentable over *Nakata et al.* and *Melanson*, whether taken alone or in combination, because both *Nakata et al.* and *Melanson* fail to disclose or suggest setting a period duration or a frequency for the pulse width modulation for switching over the switching elements of the bridge inverter as a function of the current detected.

Beside the control of the dead time as a function of the current I_{Tr} through the primary winding 19 of the transformer by means of predefined relations between the current and the dead time by means of respective tables or characteristic curves, also the switching frequency of the DC/DC-converter of the inverter will preferably be changed in dependency of the output power of the inverter. In practice, the frequency can be changed between predefined limits (for instance between 18kHz and 24 kHz) as a function of the current detected.

In summary, claims 11, 16 and 18 have been amended and claims 13, 14, and 17 have been canceled. In view of the foregoing, it is respectfully requested that the claims be allowed and that this application be passed to issue.

Respectfully submitted,
Andreas LUGER ET AL

Frederick J. Dorchak, Reg. No.29,298
Caleb D. Wilkes, Reg. No.60,873
Attorneys for Applicants

COLLARD & ROE, P.C.
1077 Northern Boulevard
Roslyn, New York 11576
(516) 365-9802

FJD:cdw

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Amy Klein

Amy Klein

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